# Coastal Assessment Resiliency Plan

*Montauk Commercial Docks Area at a Fall 2016 King Tide – J. Samuelson*

## "No Action" Vulnerability Assessment Results

Public Meeting 1
Town of East Hampton
May 16, 2017
Samuel Merrill, Ph.D.

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New York State DOS Department of State

# Resiliency Planning in East Hampton

- Comprehensive Plan
- Hamlet studies
- NYSERDA study (Dewberry)
- Coastal Assessment Resiliency Plan (CARP)

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# Coastal Assessment Resiliency Plan

Where are we in the process?

- Began in early 2016
- Today:  Public meeting 1: Viewing modeling results for sea level rise and storm surge impacts
- Next steps:
  - Explore adaptation strategies to consider for the CARP
  - Develop adaptation strategies and conceptual designs for benefit-cost modeling
  - Model these actions then present results and discuss policy and regulatory recommendations
  - Create overall CARP document
  - Implementation (2018 and beyond)

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# Coastal Assessment Resiliency Plan


- Funded by a grant from New York State Department of State
- Vulnerability to Sea Level Rise and Surge
- Conceptual Designs for Adaptation
- Benefit Cost Analysis
- Recommendations for Operational, Policy and Regulatory Changes in Response to Potential Flooding

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# Points to Keep in Mind

## Patterns of Vulnerability

- Different for the south and north of the Town
- Different for storm surge and sea level rise

## Leading Toward Action

- Next steps will include design of adaptation actions to consider for key vulnerable areas

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# Key Definitions

## Resiliency

The ability to bounce back after change or adversity. The capability of preparing for, responding to and recovering from difficult conditions.

## 100-Year Flood

A flood with a 1% probability of occurring in any given year.

*See handout for additional terms*

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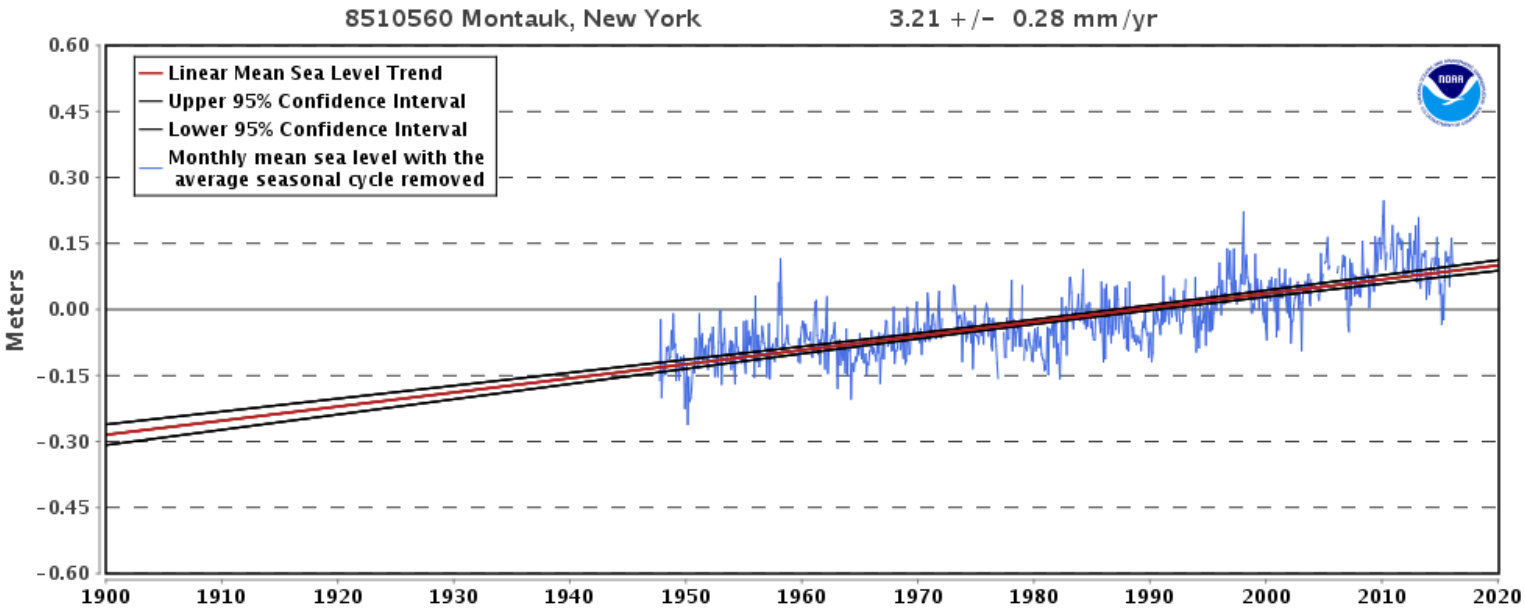
# Mean Sea Level Trend: Montauk, NY




The mean sea level trend is 3.21 mm/year, equivalent to 1.05 feet in 100 years.

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# Sea Level Rise Scenarios Applied for CARP

| | 2030 | 2050 | 2080 | 2100 |
|---|---|---|---|---|
| Medium | 6.6 inches (*0.6 feet*) | 16 inches (*1.3 feet*) | 30 inches (*2.5 feet*) | 34 inches (*2.8 feet*) |
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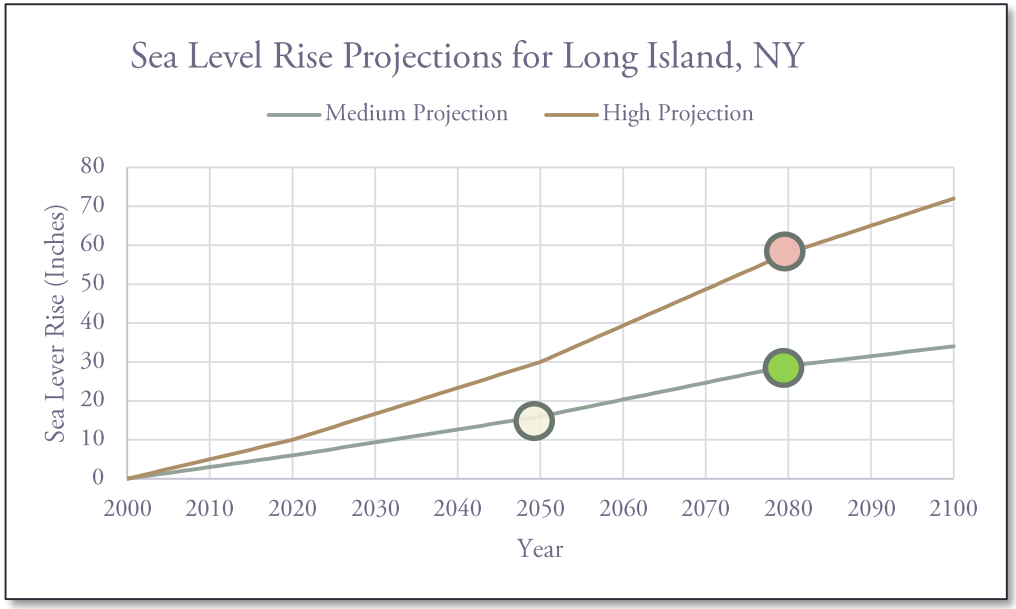


*Source: N.Y. Department of Environmental Conservation, Part 490, 6 NYCRR regulations*

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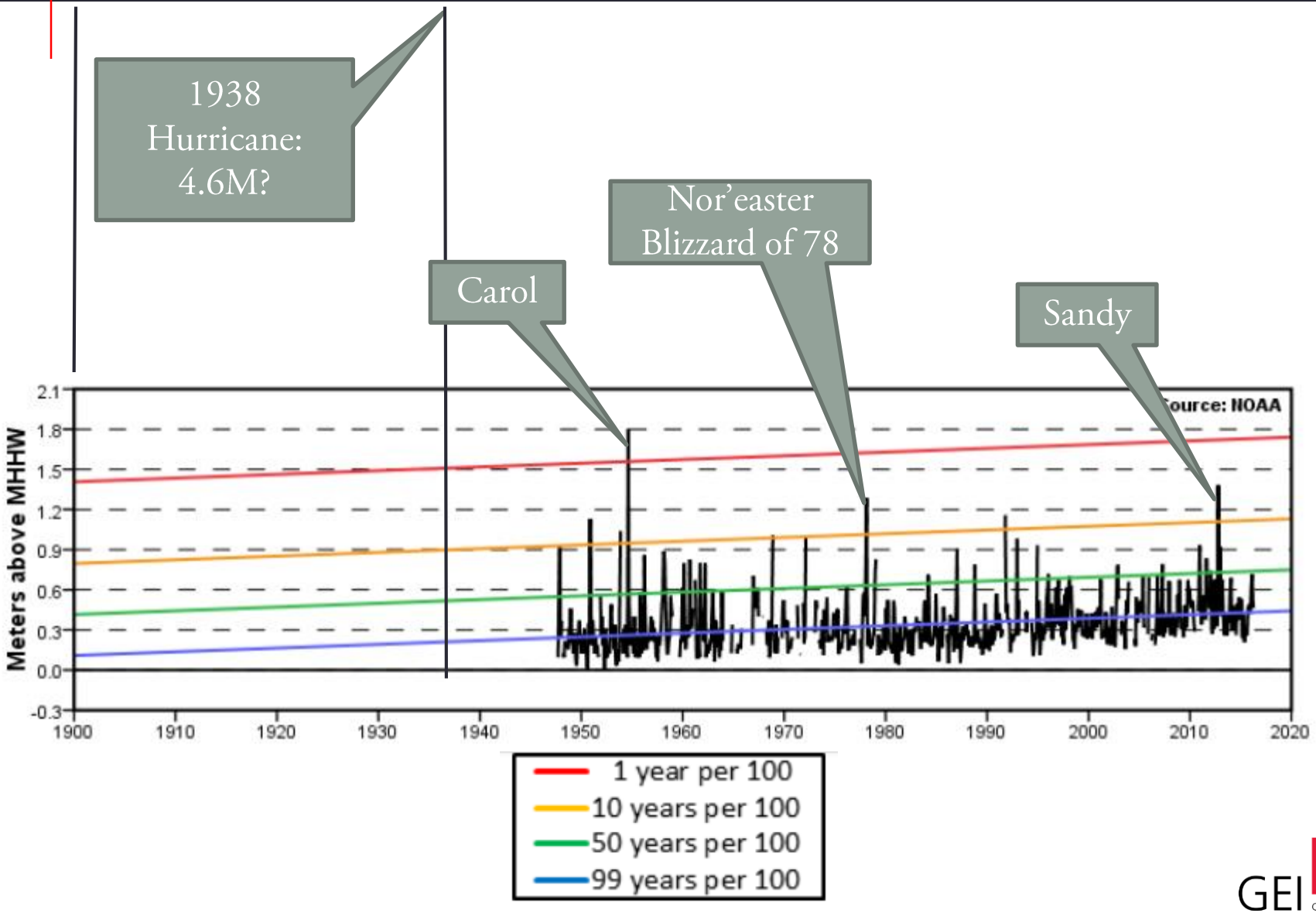
# Storm Surge Vulnerability in Montauk

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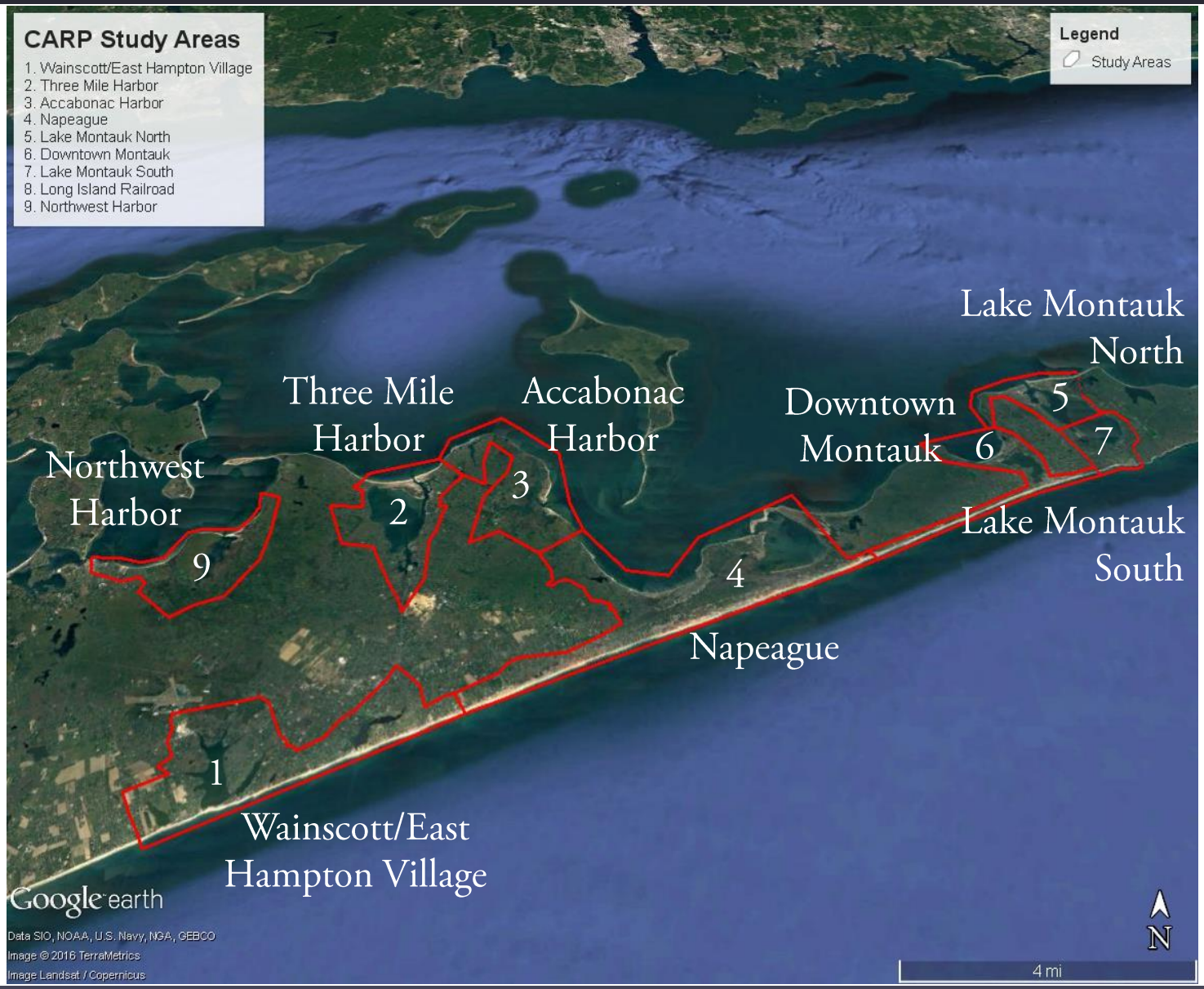
# Study Areas

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# Vulnerability Assessment

- Risk Mapping
  - New York Department of State methodology
  - Shows relative level of risk between areas
- COAST approach
  - COastal Adaptation to Sea Level Rise Tool
    - Initially developed by US EPA
  - Shows potential damages to real estate
  - Allows adaptation modeling (this summer/fall)

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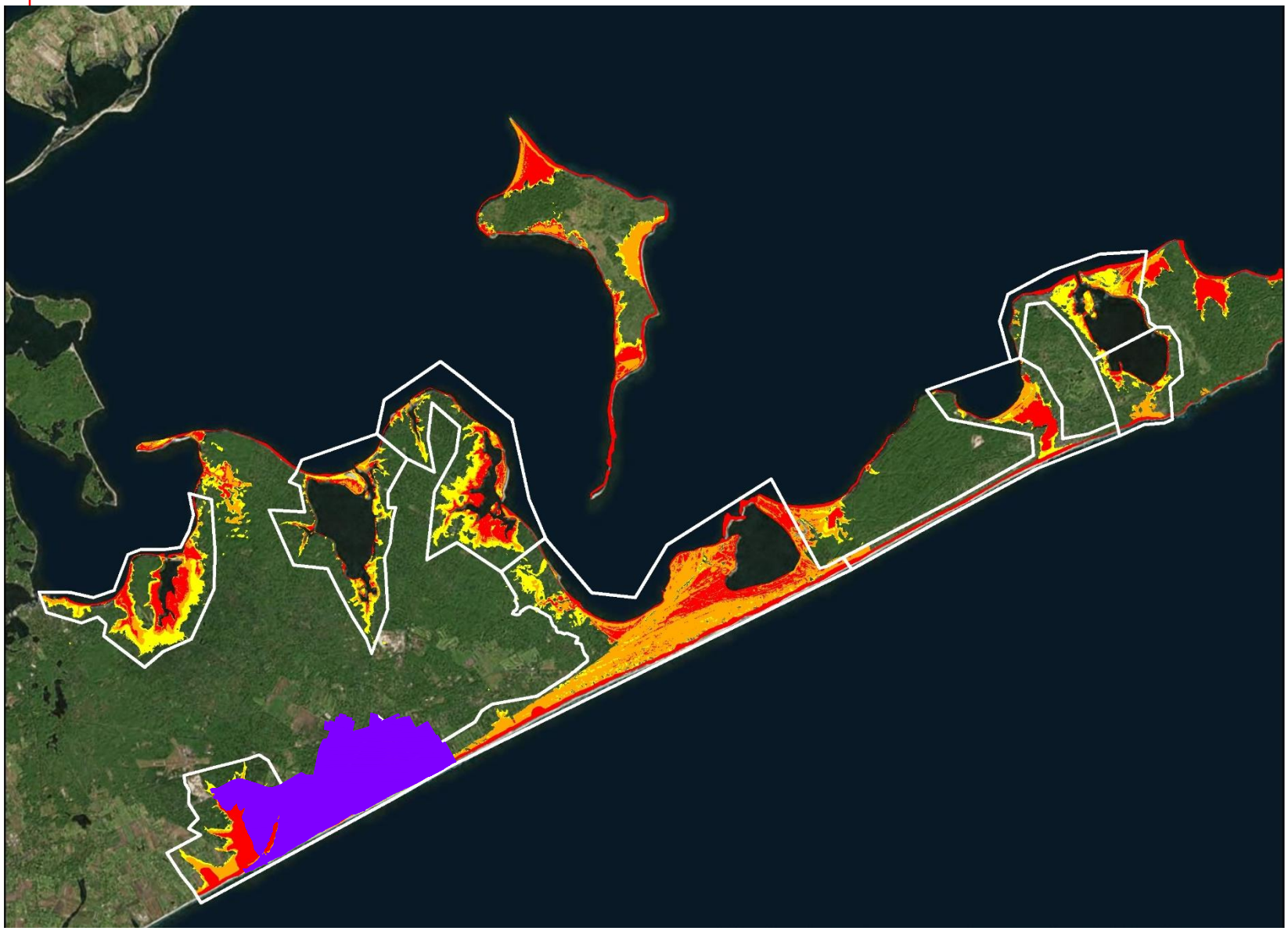
# New York DOS Method – FEMA Risk Categories



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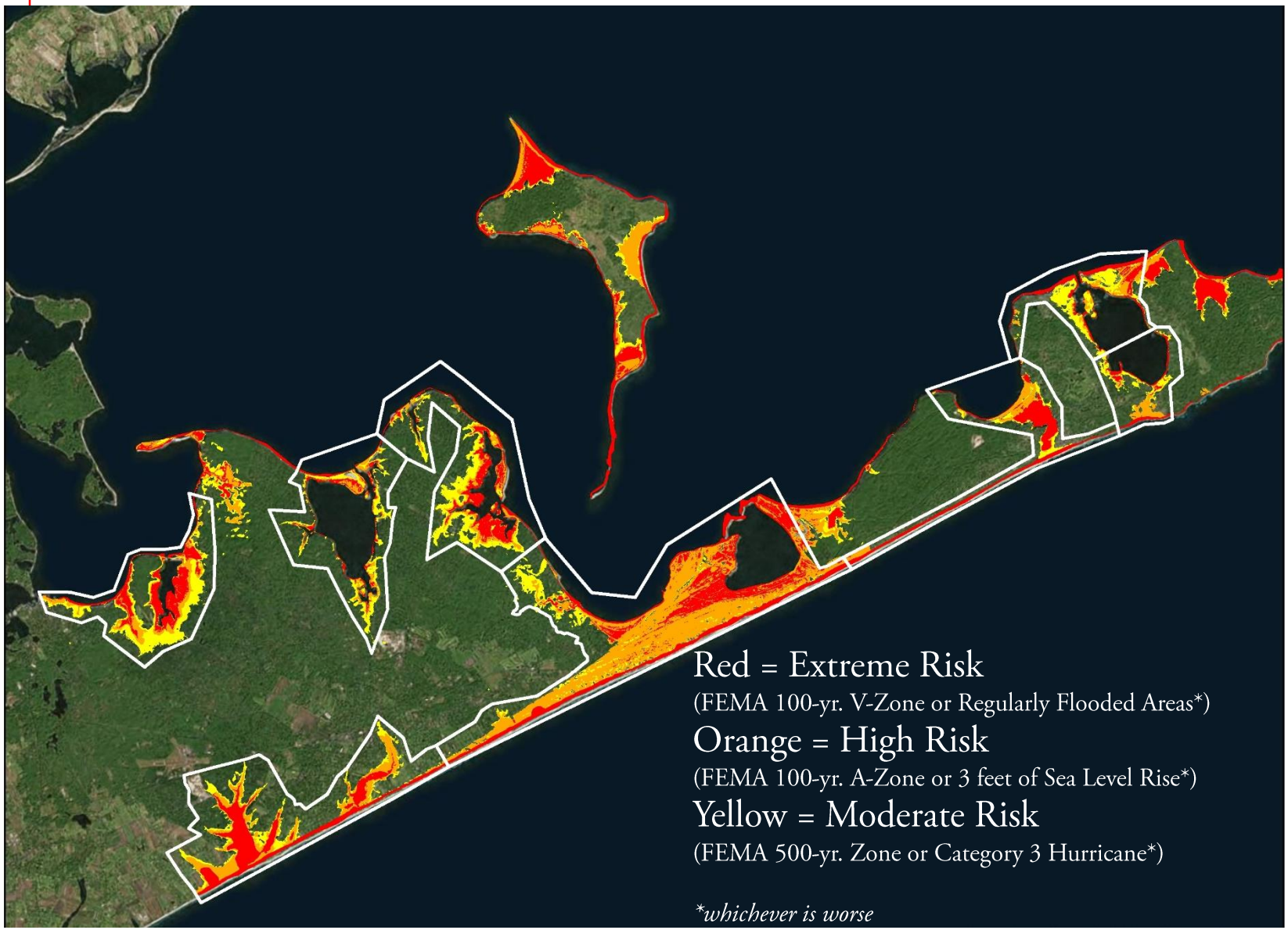


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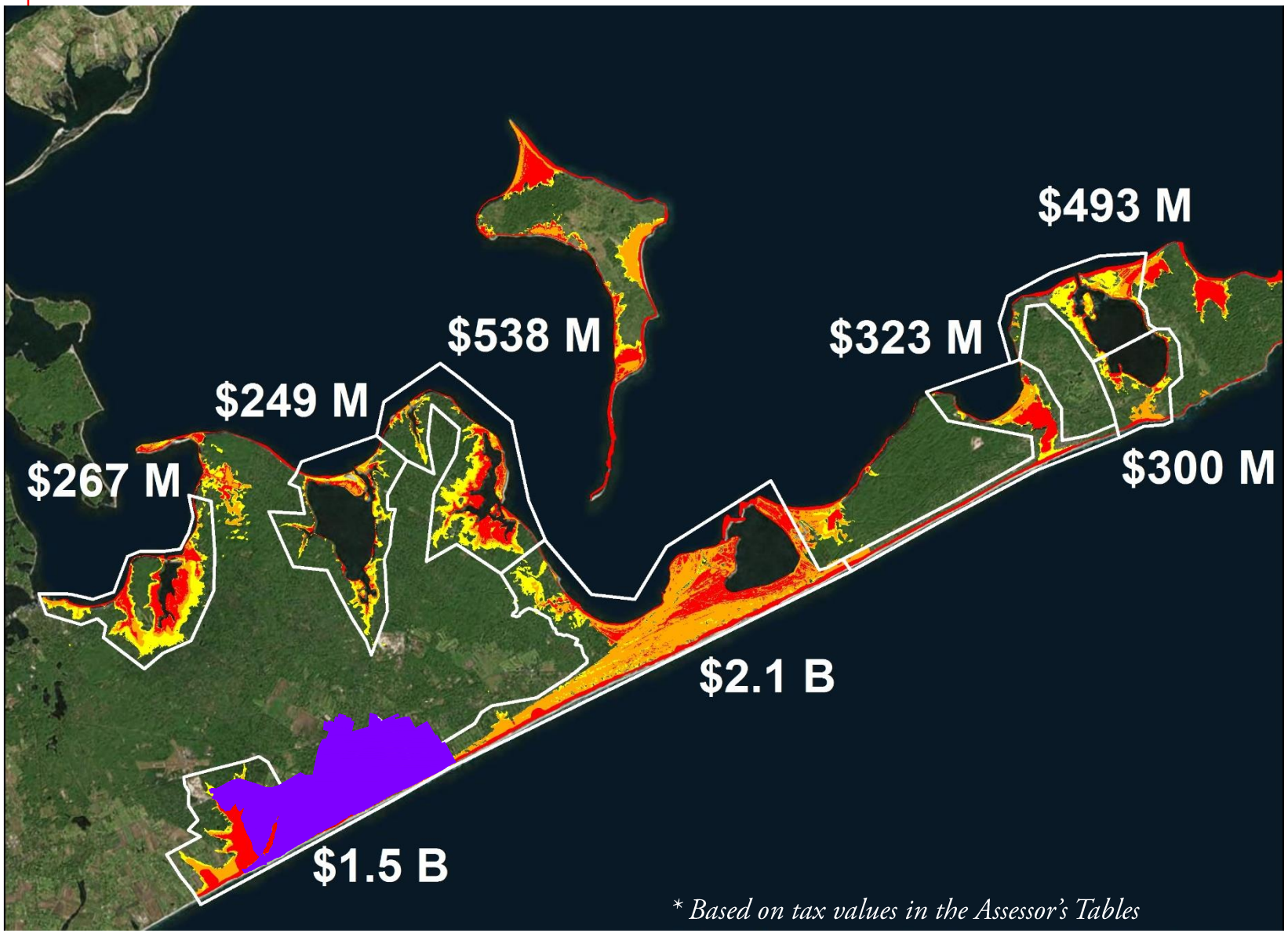
# Estimated Market Value at Risk*, All Study Areas

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# Study Areas


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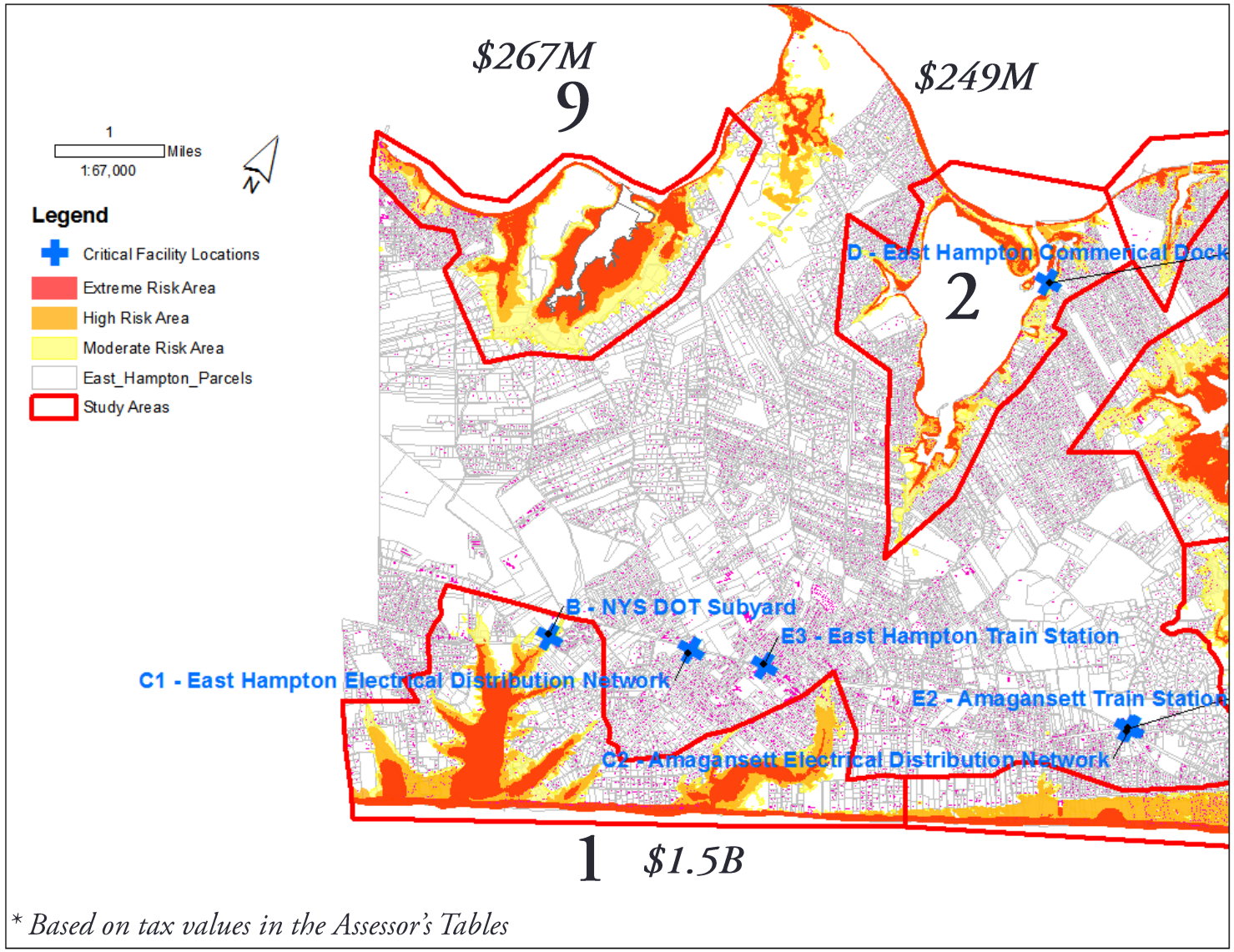
# Estimated Market Value at Risk*: Areas 1, 2 & 9




** Based on tax values in the Assessor's Tables*

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# Study Areas


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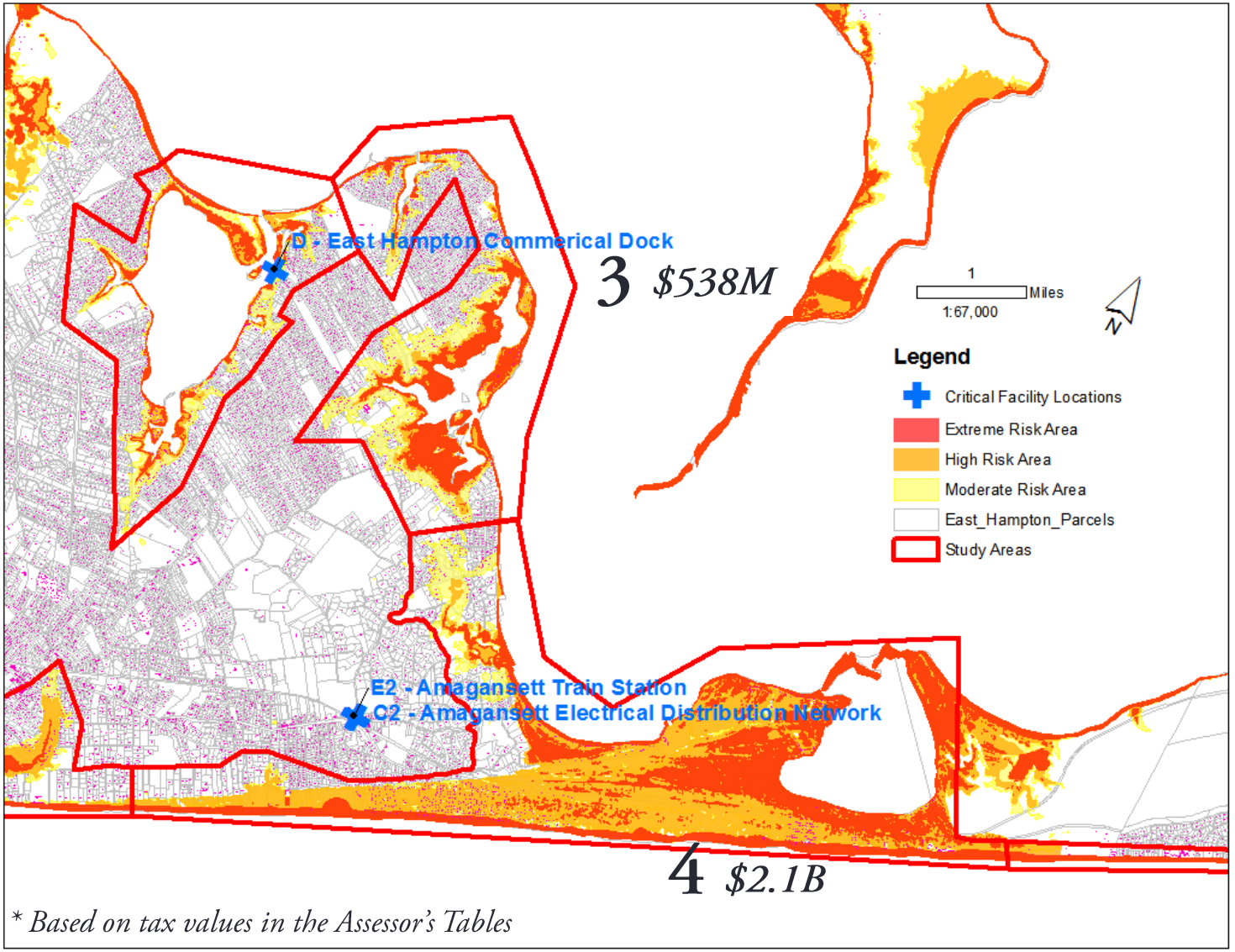
# Estimated Market Value at Risk*: Areas 3 & 4

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# Study Areas


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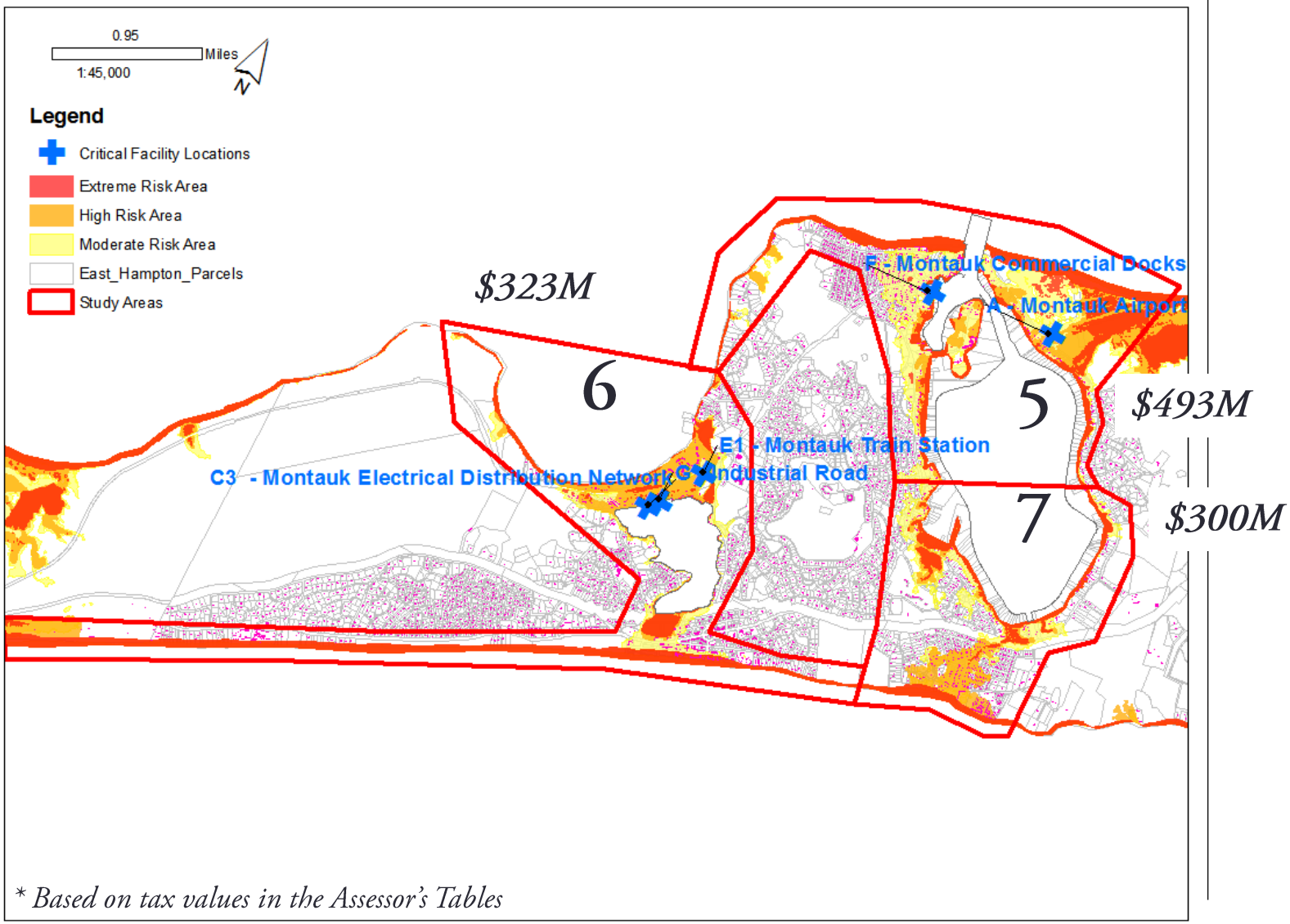
# Estimated Market Value at Risk*: Areas 5, 6 & 7

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# The COAST Modeling Approach

- Each year, parcels have a chance of being hit by storms of different sizes - surge heights include the FEMA 10, 50, 100 and 500-yr. storms
- Damage is based on depth-damage functions from federal standards used by multiple agencies
- Total damage is tallied from storms of all sizes in each year.
- Sea level goes up each year according to curves from NY DOS.

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# Limitations

- Evaluating real estate impacts only
- Not modeling:
  - Natural resources
  - Economic benefits of beaches, tourism, etc.
  - Infrastructure other than sites depicted
  - Other assets, benefits, or values

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# COAST Model Results

1. Parcels that may be inundated by sea level rise over time – from 2030 - 2080 (1.3 feet by 2050, 2.5 feet by either 2050 or 2080, and 4.8 feet by 2080)

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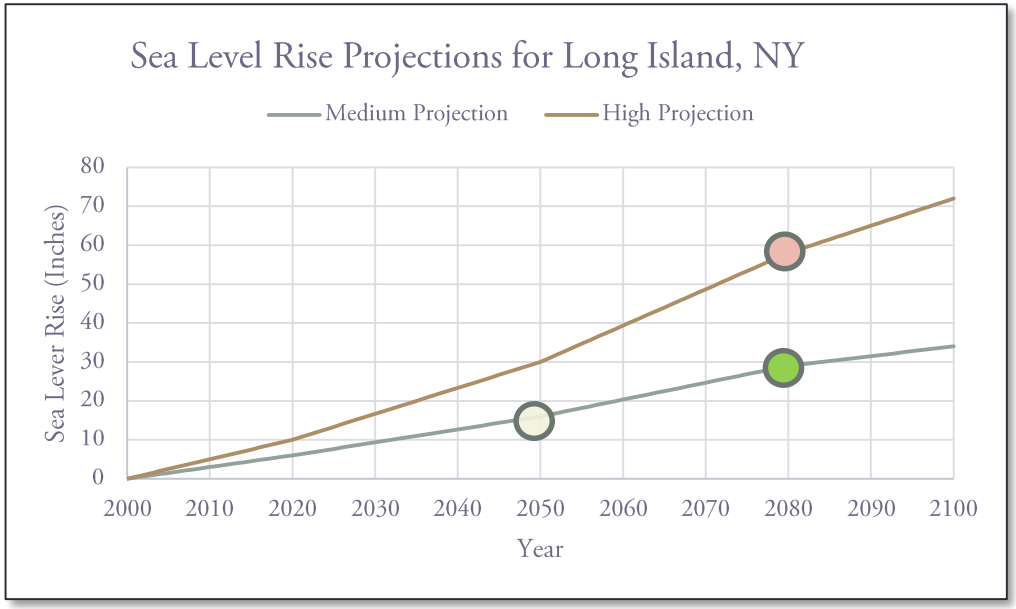


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2. Spatial patterns of estimated damage from storm surge.

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# Study Areas


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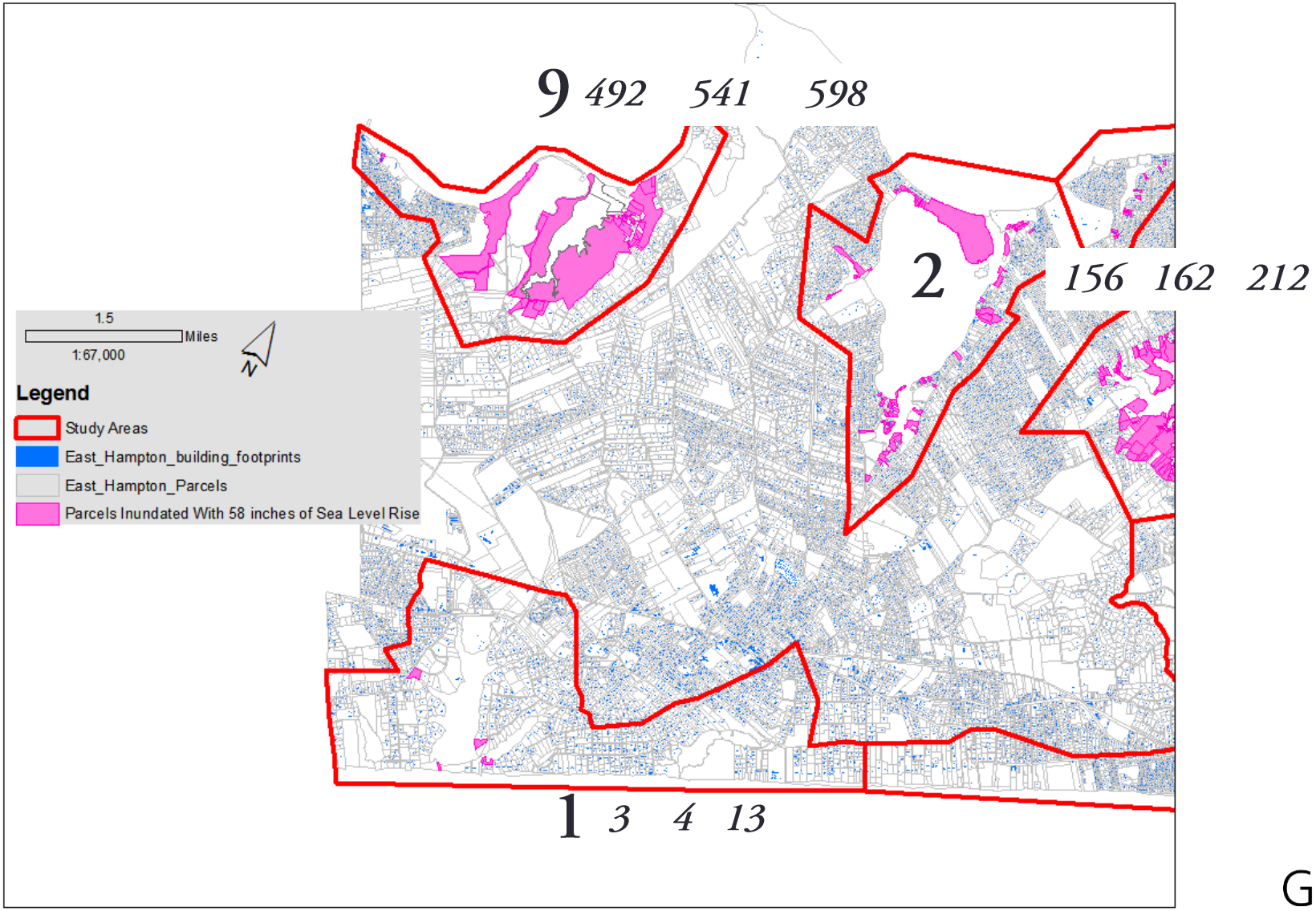
# Acres Inundated by Sea Level Rise

1.3 feet (2050)  2.5 feet (2030 or 2080)  4.8 feet (2080)

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# Estimated Market Value Inundated by Sea Level Rise

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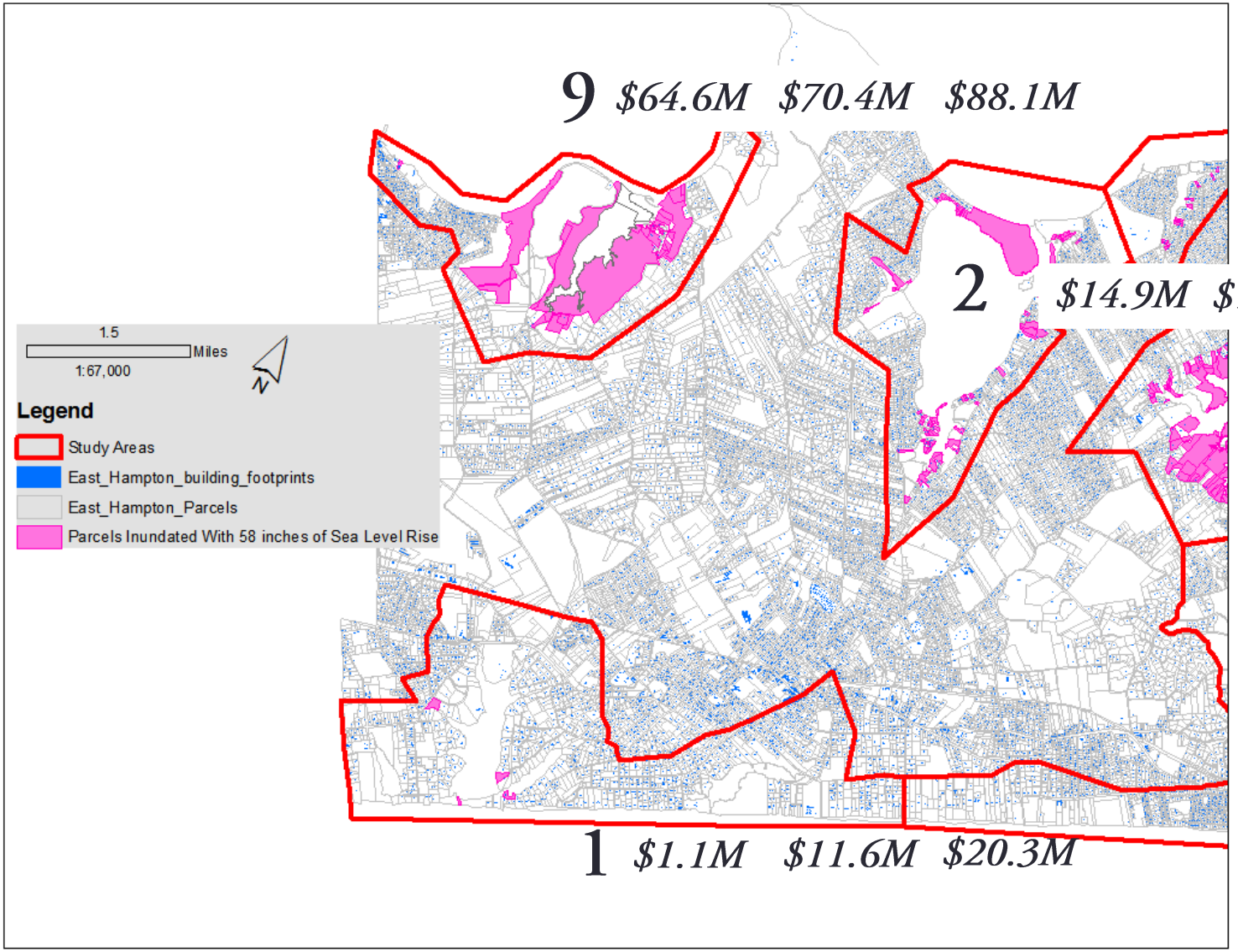


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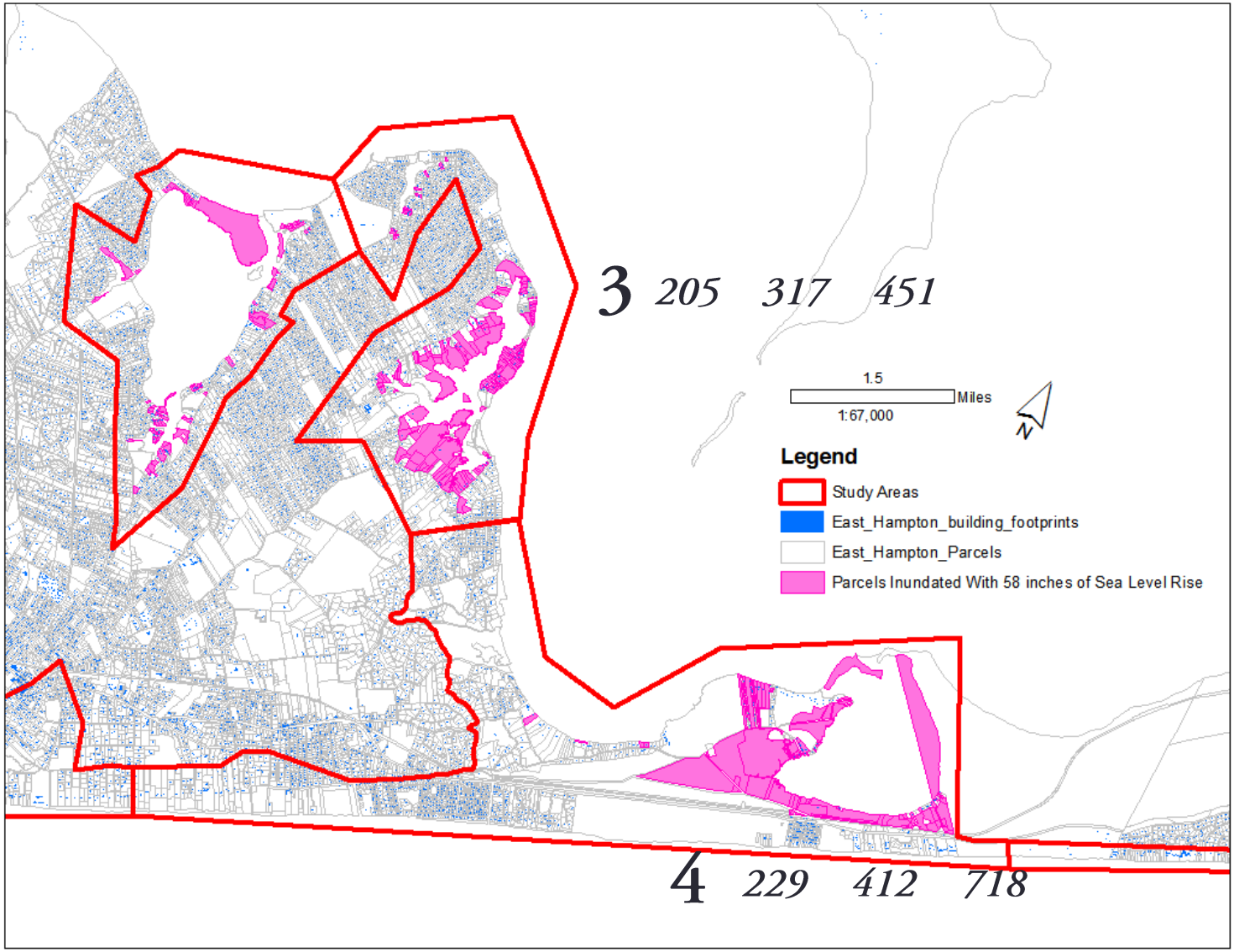


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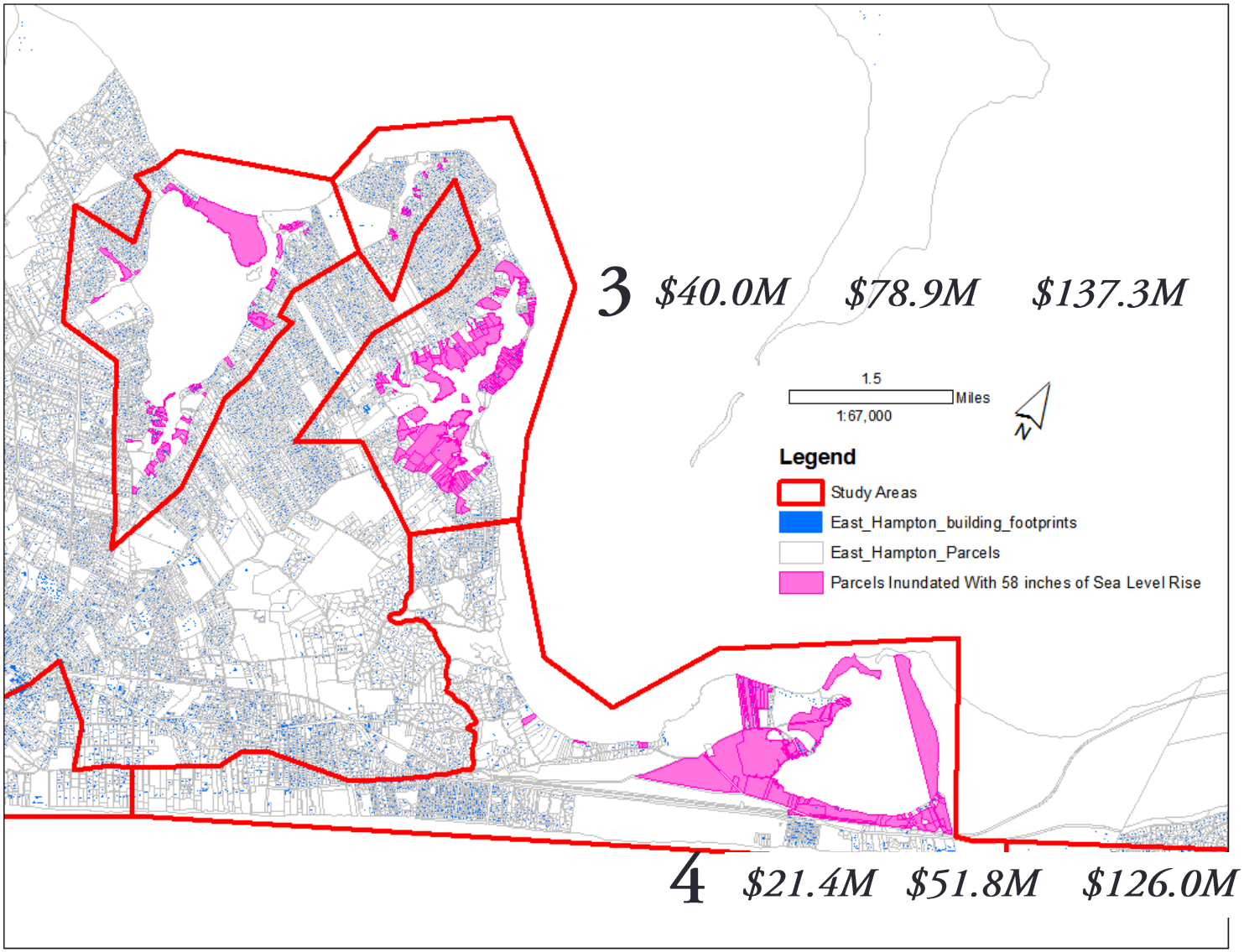


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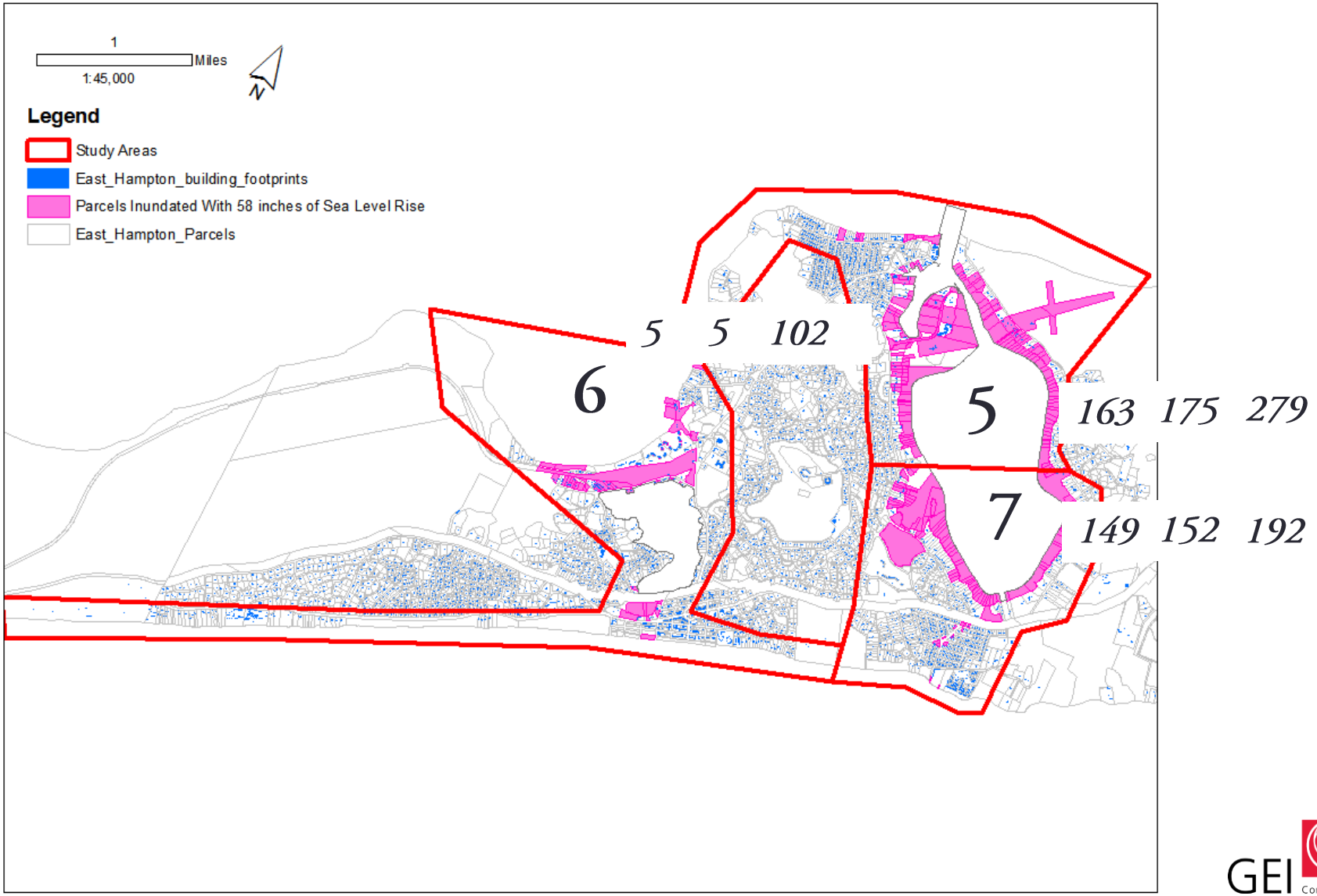


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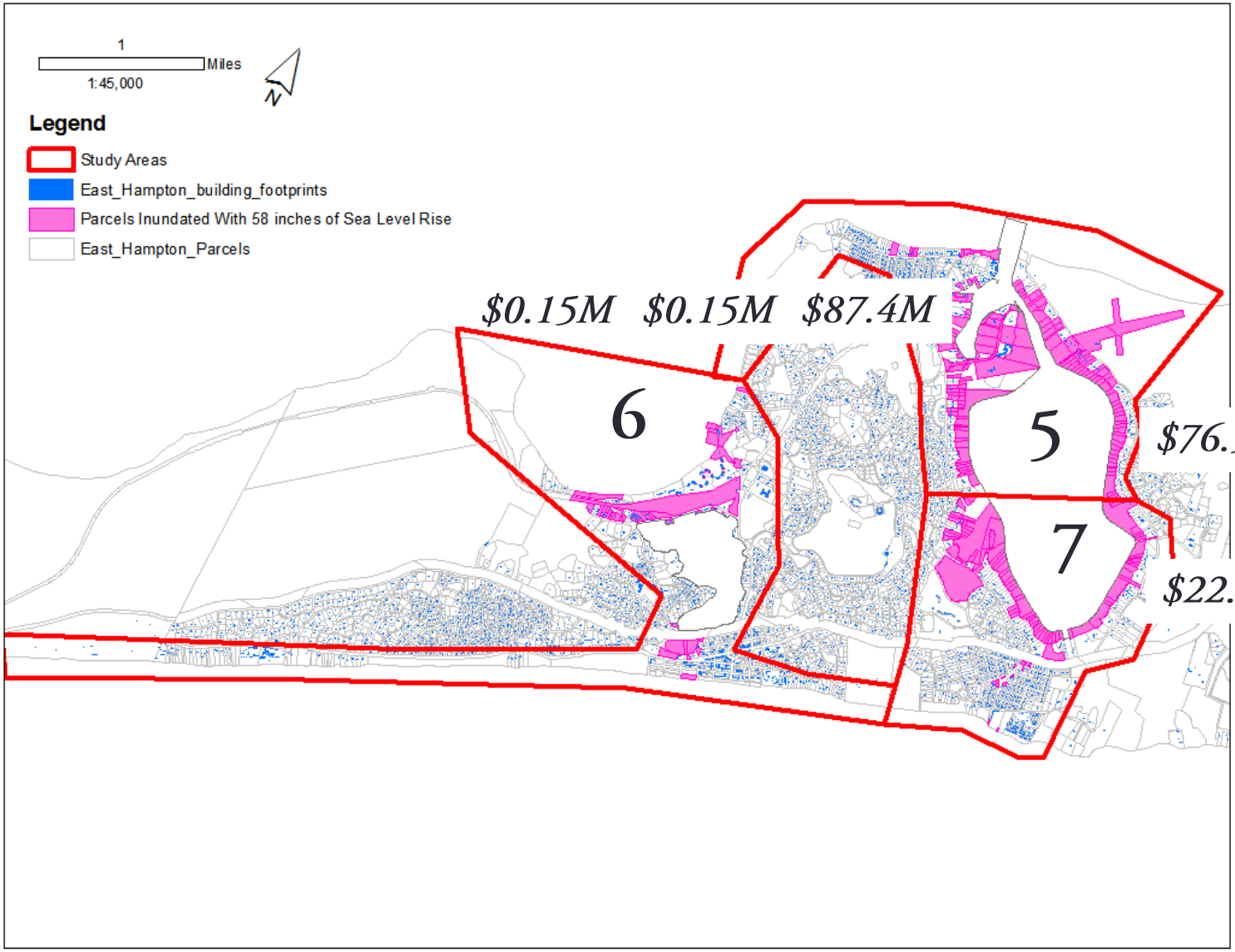


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# Tours of the Study Areas and Results

1. Parcels that may be inundated by sea level rise over time (1.3 feet, 2.5 feet, and 4.8 feet)
   - Acres
   - Dollars of exposed real estate value
2. Spatial patterns of estimated damage from storm surge.

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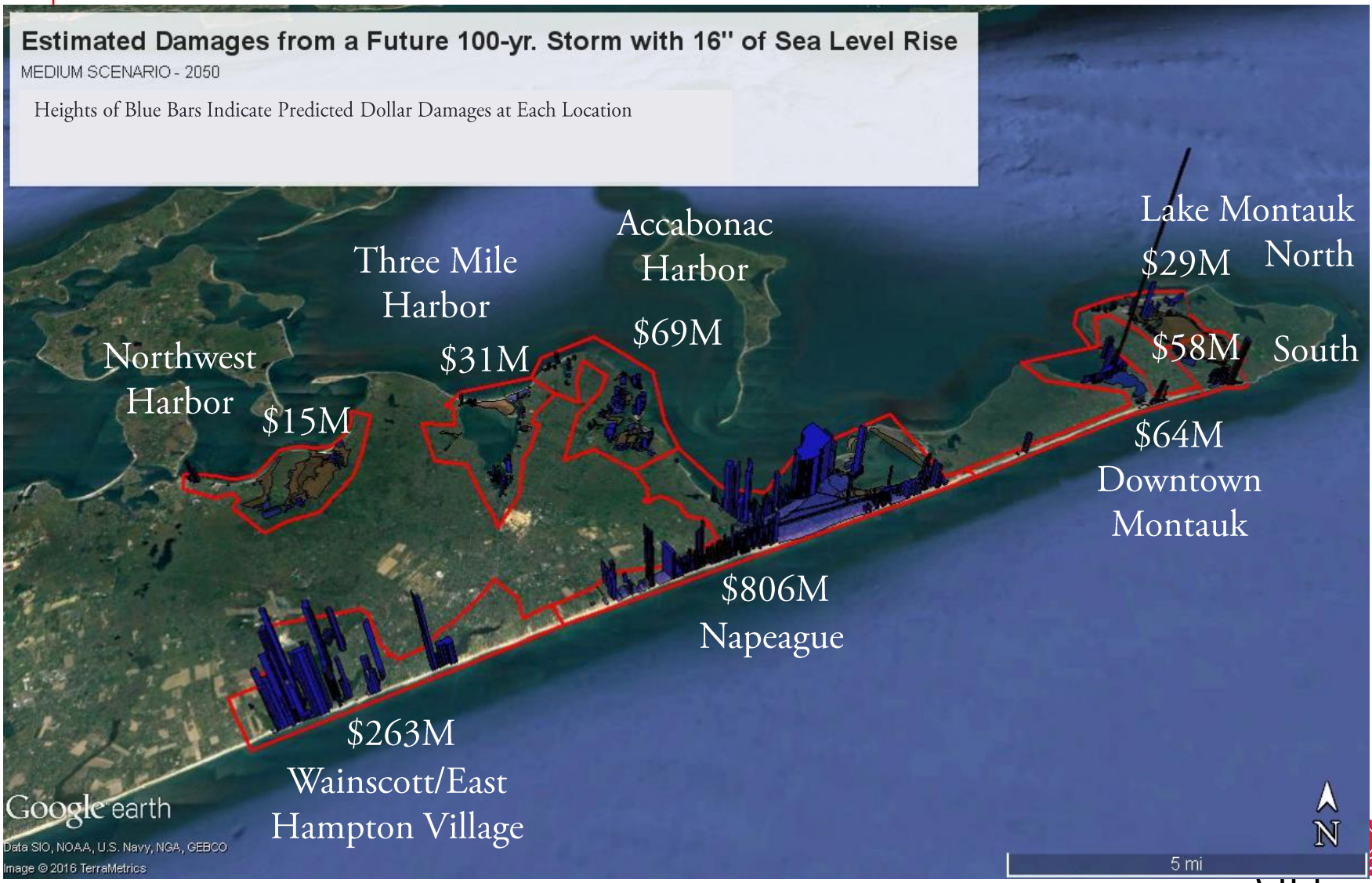
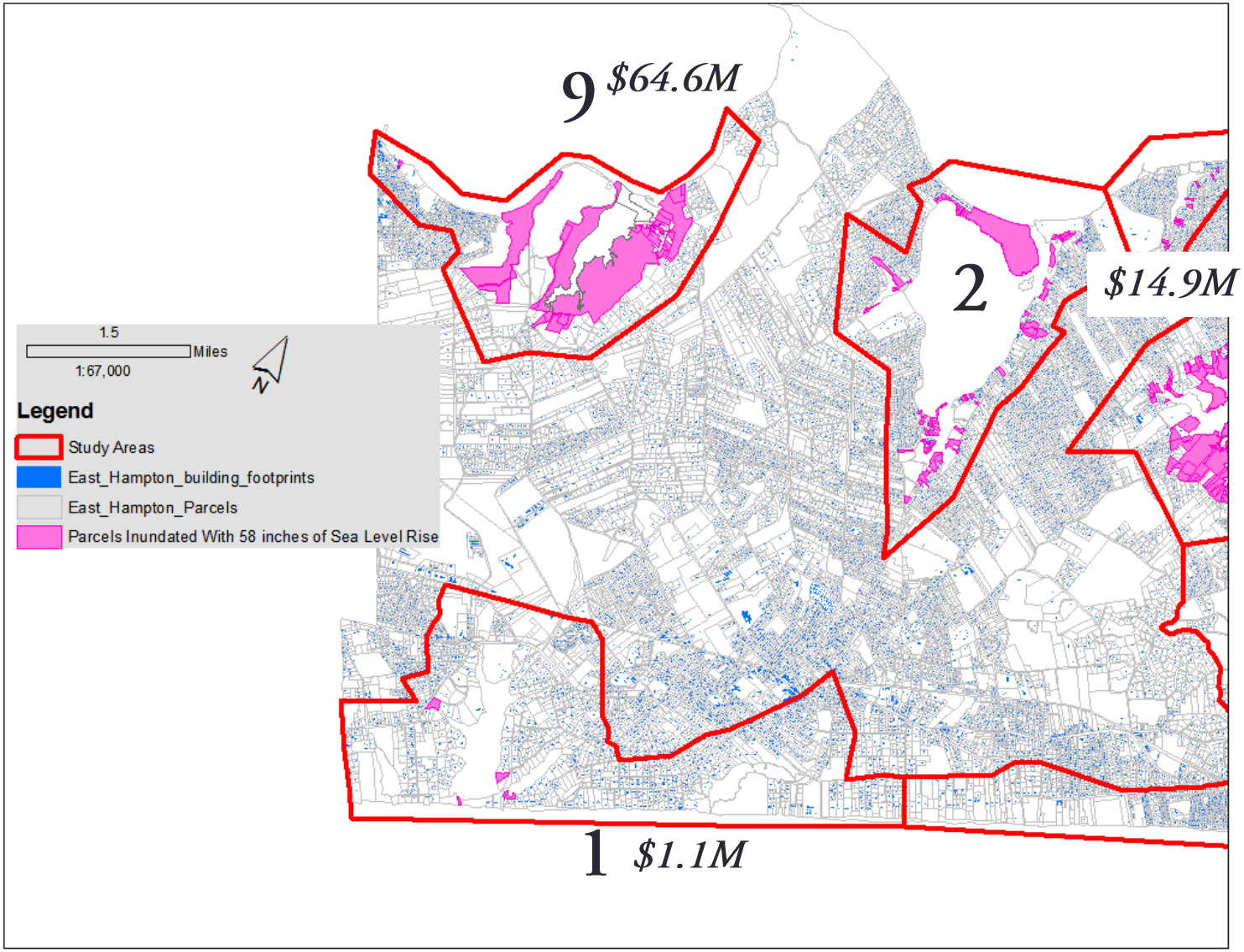
# Patterns of Damage from a Single 100-yr. Storm

# Total Damage from All Storms by 2080



# Areas 1, 2 & 9: Value of Parcels Inundated by Sea Level Rise – 1.3 feet

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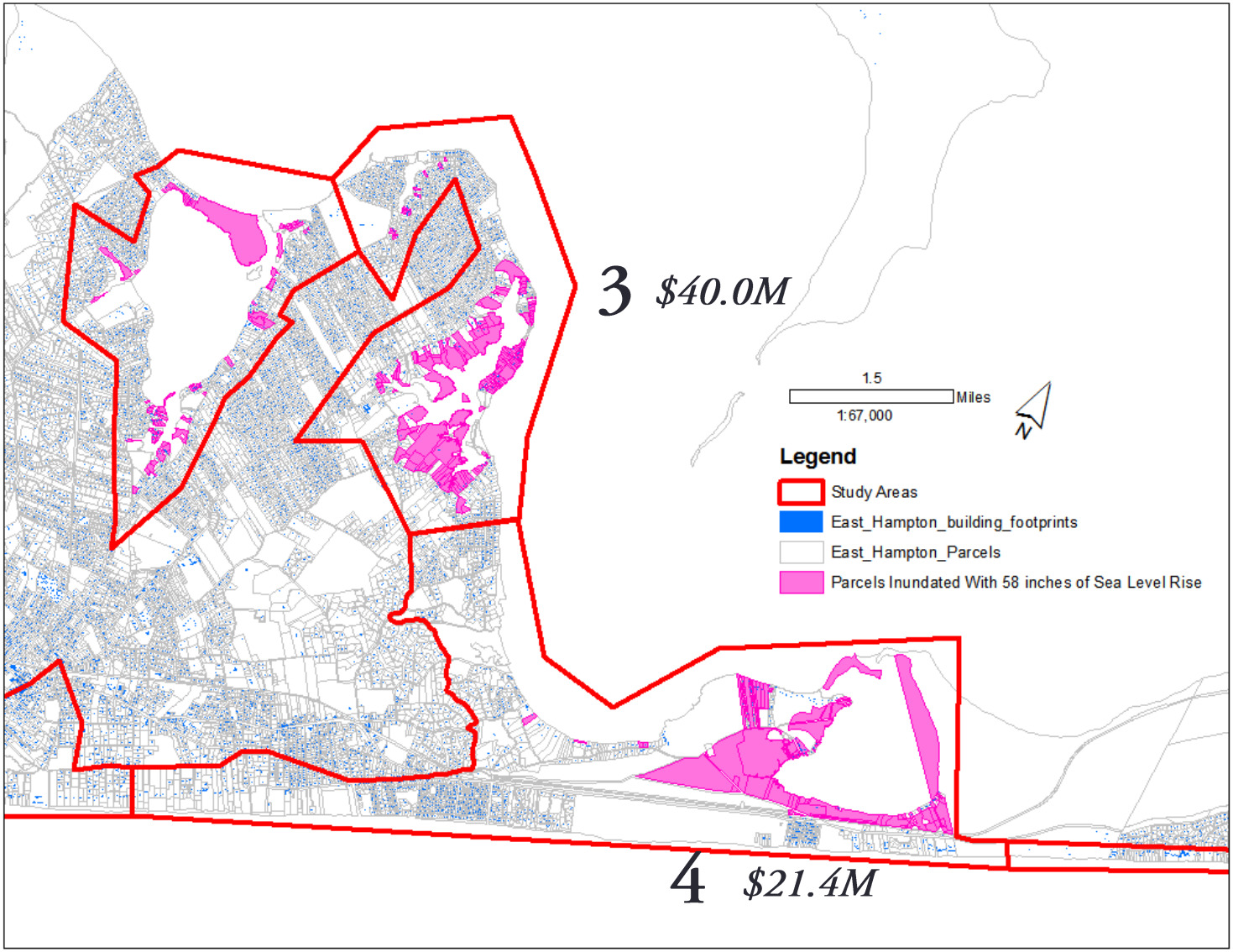
# Areas 3 & 4: Value of Parcels Inundated by Sea Level Rise – 1.3 feet

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# Takeaway Messages

- For sea level rise:
  - Highest inundation over time occurs on the bay side of Town (Northwest Harbor, Accabonac Harbor, and Lake Montauk North) … in *acres* and in many cases, *dollar value*
- For storm surge, the pattern is reversed:
  - Napeague and East Hampton Village have the highest exposed dollar value, both in the short term and over the next 50 – 60 years

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# Critical Facilities

| Critical Facilities |
| --- |
| Montauk Airport |
| Montauk Electrical Substation |
| East Hampton Commercial Dock |
| Montauk Train Station |
| Montauk Commercial Docks |

*Montauk Commercial Docks Area at a Fall 2016 King Tide – J. Samuelson*

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# Takeaway Messages

- Sea level rise:
  - Highest inundation over time occurs on the bay side of Town (Northwest Harbor, Accabonac Harbor, and Lake Montauk North) … in *acres* and in many cases, *dollar value*
- But for storm surge the pattern is reversed:
  - Napeague and East Hampton Village have the highest exposed dollar value
- Critical facilities:
  - Storm surge: most of these facilities are vulnerable now
  - Sea level rise: there are several decades to adapt these facilities, but if adaptation action is not taken, they can be expected to be underwater at high tide every day

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# Next Meeting: Strategies for Resiliency

We'll consider actions to evaluate:

- Community level: public infrastructure investment
  - Shore line barrier or augmentation
  - Road, rail, or infrastructure elevation
  - Living shorelines and open space protection
- Parcel level
  - Flood proofing (wet/dry)
  - Building elevation
- Targeted Policy Actions
  - Voluntary buyouts
  - Incentives to move buildings out of harm's way
  - Zoning in relation to properties at risk (e.g., to address building location/size/transfer of development rights)

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